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The Pascua Yaqui Connection
Project Narrative

Project Purpose

Defining the problem—Arizona is home to nearly 10% of the country's entire Native American population. There are 20 distinct regions of tribal land in the state, totaling more than 19 million acres. The Pascua Yaqui tribe has some 12,000 members scattered in five communities in southern Arizona. New Pascua is the largest of these communities and is located in Pima County, just outside Tucson.

Educational attainment for Yaquis is generally very low. Based on 1990 Census data, an estimated 42 percent of adults have less than a 9th grade education. An additional 33 percent of adults have had some high school education but lack a diploma. These data suggest that three quarters of adults in Pascua Yaqui communities do not have enough education to compete for jobs at higher than minimum wage. With 61% unemployment on the reservation, per capita income at New Pascua was $3,138 according to 1990 census figures, compared to $11,184 for the City of Tucson.

Although this community is only 15 miles from Downtown Tucson, access to the City by public transportation means a two-hour bus ride for the New Pascua Yaquis, the majority of whom have no available private transportation. This isolation presents barriers to accessing much-needed education, job training, and employment opportunities.

Proposing a solution—Pima Community College has a State mandate to provide educational opportunities to all the citizens of Pima County. In partnership with the University of Arizona and the Tribe, the College proposes to bring educational and training opportunities to New Pascua electronically.

Specifically, the project will establish a 20-work station computer lab at a site on Tribal land in the New Pascua community. The site will be connected to both Pima Community College and the University of Arizona via a T-1 line.

Native Americans are underrepresented in science career fields. An effective way to involve Native American youth in science is to expose them to land use issues and data. Members of the Pascua Yaqui tribe have demonstrated interest in environmental science, but have had no access to data bases or conveniently located training or academic programs. This project will deliver on-line science modules created with GIS and other land use data collected by the University of Arizona.

Identifying outcomes—Improved high school student retention, greater interest in science careers among youth participants, increased opportunities for adult basic education and higher completion rates, on-line job training, on-line student services to aid student retention and success rates, access to learning technologies to Tribal community members, and assistance to developing Yaqui language communication methods. Deliverables to aid these outcomes include science modules to at-risk charter high school students, electronic delivery of adult basic education, community access to Internet and e-mail, software training for community members, network management training to lab manager, and module adaptation help to the Tribal charter school and Tribal teachers.

Significance

Describing innovation—Highly motivated faculty and staff at the University of Arizona (UA) have formed a multi-disciplinary, multi-departmental group to seek new ways of using research data in the teaching of undergraduate classes. This group is known as the Southwest Project. From its inception the Project has included Pima Community College (PCC) and the Tucson Unified School District (TUSD), as its partners. The Project has developed computer based learning modules utilizing decades of raw data from the UA's Santa Rita experimental range, located in southern Arizona, and the ancestral hunting and gathering range of the Yaquis. The modules are being piloted currently in Renewable Natural Resources undergraduate classes in the UA's College of Agriculture and will be further tested this summer with TUSD English teachers from grades 3 through high school and PCC English Composition faculty. The modules present visual representations of land data, the parameters of which the student can control. The visualizations can be scaled to K-16 levels of application for a multitude of lesson approaches to various academic subjects.

The use of local data in a visually recognizable format creates a context for learning that allows for successful progress among many learning styles. This method of presenting data is particularly relevant to Native American students, whose visual acuity is often high and whose cultural values place a relationship to the land in great esteem.

Yaqui attendees in PCC campus-based computer courses have been successful. However, the geographic and cultural barriers to attending campus classes prevent most Tribal community members from having access to this training. A community-based facility will allow for more efficient delivery without relying on a traditional classroom. Further, an all-Yaqui communal computer lab has the advantages of cooperative learning and group sharing of information, consistent with this group's learning preferences.

The electronic medium of delivery will itself enhance literacy among Pascua Yaqui users. One must be able to read to use the Internet. Among cultures with a rich oral tradition, some individuals have difficulty finding a connection between their experiences and written language. The Internet can bring them into contact with meaningful text, accompanied by lavish visual imagery. Combining Internet access for community members with computer-based ABE will reinforce positive experiences with text and learning.

Establishing an exemplary project—This project seeks to provide the connectivity and workstations to this particular group of Pascua Yaquis in order to deliver to them many forms of educational experiences. Formal education at K-14 levels will utilize these land modules in many ways. Informal community enrichment will also employ the modules to provide research material, information for decision-making and public discussion, and Tribal land use policy making and deliberation.

In addition to the above uses, the multi-media computer lab will be used to deliver adult basic education courses and GED preparation and tutoring, PCC Internet courses, computer-based training, and on-line student services, and UA

Extended University on-line courses and services. The Tribal community will have open access to the lab for Internet use and e-mail accounts. The lab will become a Tribal resource for education, vocational training, and communication with the world.

The lab at New Pascua will be networked; it will have Internet service, and it will be supervised and maintained by a Tribal employee in order to ensure community involvement and ownership. This network manager will receive NT network training and software training as part of the project and will have basic troubleshooting and equipment maintenance skills to assure reliable service.

Project Feasibility

Technical approach—The technologies proposed are stable and widely used for computer on-line networks and Internet accessibility. The lab and network will be interoperable universally and scalable, not only for each of the three years of the project, but by the Tribe on a continuous basis. Adding work stations, more servers, more sophisticated hardware as available, and new software will be easily accomplished with this proposed lab. The Tribal lab manager will continue to receive training and skills upgrades throughout the length of the project. Teachers and other end users will participate in collaborative seminars and one-on-one workshops as new software and modules are introduced to the lab. The choices of technologies for this project do not represent exclusions of other possibilities: videoconferencing and compressed video instruction, for example, are viable additions that are beyond the scope of this particular project.

Qualifications--The UA's network infrastructure supports some 20,000 work stations, including 140 buildings on campus and 45 buildings off campus. Multiple FDDI, Ethernet, T-1, frame relay circuits, and fiber connections are all managed by the University's telecommunications staff. The network includes K-12 school districts, community buildings, City of Tucson and other governmental connections, and Pima Community College's administrative offices. The UA's expertise in extensive network management provides a solid basis for the additional connectivity proposed in this project.

As a large land-grant research university, the UA has decades of research data, which can be made available for instruction. The Southwest Project at the UA consists of more than 50 faculty and staff across the campus in partnership with other education providers to develop on-line learning environments that integrate research data sets into effective instructional modules. The group's projects have earned the support of campus administration, including UA President Likins, to fund module development, assessment, and deployment. Interwoven into the Southwest Project are other campus groups: the Library will mount research data and make it usable for module development, the Faculty Development Partnership is seeking ways to train faculty as both end users and materials developers, the Assessment Center (known as the Infomatics and Decision-making Lab) is involved in measuring and evaluating uses of technologies in teaching, and Telecommunications is responsible for providing and maintaining the infrastructure. These participants bring to bear their

particular areas of expertise in all phases of module planning and implementation and to this project.

Pima Community College has been in existence only 30 years, but has grown to serve more than 50,000 students per year in Pima County, the nation's 4th largest multi-campus community college. The College offers transfer curricula, vocational training and certification, and general education. PCC has a low tuition rate ($32 per credit hour) and an open-door enrollment policy with extensive developmental coursework and student support services to make a college education accessible for all its constituents.

PCC's faculty has won many awards over the years for innovative teaching approaches from the National Institute for Staff and Organizational Development. The College has recently entered into a partnership with Pima County to deliver adult basic education and GED preparation. This collaboration will present even more extensive student preparedness choices and a continuum of educational services. Pima County Adult Basic Education staff will work closely with this project to expand their offerings at New Pascua. They anticipate a 100% increase in offerings and participants over the course of the 3-year project by implementing electronic delivery and having readily available self-paced computer resources at the Tribal lab.

The College has a successful history of distributed learning efforts. In addition to its five campuses, PCC operates education centers in more than 100 sites in Pima and Santa Cruz Counties, including State and Federal prisons and military installations. The College has concurrent enrollment programs in many area high schools. In addition, PCC operates 24-hour telecourse programming over 2 channels on all cable service providers in Pima County. The College offers a complete Associate Degree program via cable television. In 1997 the College built a telecommunications and training center at its Community Campus, complete with state-of-the-art television production facilities and multi-media labs.

In the past two years PCC has begun offering courses on the Internet and via two-way interactive classrooms to off-site locations. Enrollment in all these delivery media has proven to be sustainable and growing. The College administration has made a financial commitment to expand its interactive system and upgrade its telecommunications infrastructure. Faculty development initiatives and expansion of multi-media development facilities are underway to enable faculty to utilize appropriate technologies in course content development and delivery.

Dr. Marigold Linton will serve as the project's external evaluator for each of the 3 years. Dr. Linton is a member of the Morongo Tribe and a national advocate for increasing participation of Native Americans in the sciences. As a psychologist and researcher, she will bring together the scientific approach to evaluating teaching and learning with her deeply felt convictions on the needs of Native Americans.

Budget and implementation—While not applicable to this funding request, the Pascua Yaqui Tribe will contribute funds for building renovation and retrofitting for their computer lab, as well as salary and fringe benefits for their lab

manager. The Tribe will assume connectivity costs and provide learning materials. At the end of the grant period, the Tribe will assume costs for any hardware and software upgrades to the lab.

The UA will provide overall network management staffing, troubleshooting, and training. The UA's Southwest Project will provide land use modules and software for use with the modules. An assessment team from the UA's Assessment Center will work with project participants.

PCC will provide project management and coordinate all training efforts. PCC's award-winning Production Services Department will document the project on video, creating a media-based "story" of the entire process. TIIAP is asked to fund computer hardware and software, connectivity, some training, and assessment/evaluation. The partners and the grant will jointly fund documentation and dissemination.

Implementation is scheduled as follows:

Year One:
- Tribal building renovation
- Equipment purchase and installation
- Tribal network manager hire and training
- Module workshops for teachers
- Install ABE software; train Pima County teachers
- Pilot ABE teaching with Yaqui adults
- Pilot module deployment with Yaqui students
- Develop initial assessment measures
- External evaluator visit project and report
- Begin video documentation of project

Year Two:
- Expand education services to Yaqui community
- Continue lab manager training
- Expand teacher training with new modules
- Establish Tribal Internet radio service
- Expand ABE offerings in lab for adults
- Begin development of Yaqui language software
- Employ and expand assessment measures
- External evaluator visit project and report
- Continue video documentation of project

Year Three:
- Expand teacher training with new modules
- Refine assessment tools, make course corrections
- Operationalize on-going costs among partners
- External evaluator visit project and report
- Complete video documentary and distribute
- Partner representatives publish and present findings and results

Community Involvement

The partners—The New Pascua Tribal Council has endorsed this project and committed Tribal funds for its establishment and operation. This decision is in keeping with the Tribal mission statement to, "Maximize the resources, both

human and material, available to all community members to enable access to the whole continuum of educational opportunities to ensure life-long learning." As a result of a 1997 community needs assessment, the Tribal Council has identified a priority to improve information technologies available to all community members. Improvements in education and information delivery are seen as measures, which can partially alleviate some of the Tribe's social, economic, and health concerns. Because the Tribe is geographically diverse, its members are seeking more efficient communication methods. Tribal members at New Pascua have expressed a desire to connect all their villages electronically. New Pascua is the political, social, medical, and educational hub for the Tribe. This project will germinate members' comfort with technology by allowing them to explore it for themselves, use it to learn and to create, and to express themselves at their own pace and in their own community.

Pima Community College has been working for many years with the Tribal Council and Education Department to respond to education needs and requests of the Pascua Yaquis. As partners, the Tribe and the College have developed accredited Yaqui language courses and have solicited and placed Yaqui students in academic and training programs. PCC and the Tribe continue to cooperate on such projects as Talent Search and Upward Bound for youth, a family literacy project, and a USIA-funded youth exchange program to Kazakhstan. As part of its mission, the College seeks to widen access to education, training, and enrichment opportunities to all its constituents, most especially to those who are disenfranchised and may be at risk. When brick and mortar solutions are inappropriate, the College employs innovative methods to bring educational solutions to people. Electronic delivery has become increasingly feasible and accepted in such previously isolated communities as New Pascua.

The College has a close working relationship with the University of Arizona, enjoying broad articulation of PCC courses into UA transfer programs. The two institutions share many adjunct faculty and various academic partnerships of mutual benefit. PCC is an original member of the UA's Southwest Project, and as such shares an abiding interest in that group's aim to bring academic research data into classroom teaching applications.

The University has a great many academic resources, which can be brought to this project: its Faculty Development Partnership can work with PCC faculty and K-12 teachers to help classroom teachers learn new technologies and apply them appropriately. The UA's Assessment Center can design and coordinate both quantitative and qualitative measurement tools for the project. Its Telecommunications staff brings computer and connectivity expertise to all levels of the endeavor. As a research institution, the UA supports inquiry, problem solving, and documentation. As a teaching entity, the University seeks effective ways to expand its services. As a community resource, the institution actively enters into collaborations to improve living conditions and opportunities in its service area.

Community involvement—In order to deliver adult basic education and GED preparation to New Pascua community members electronically, materials must be provided for on-line use. PCC has begun evaluating ABE software and

will provide software to the project. PCC also will work with teaching staff from Pima County's Adult Basic Education Department to pilot these materials at the New Pascua lab.

End user support—The Yaqui community users of this facility will be supported in the following ways: the lab will be run, maintained, and upgraded by an on-site Tribal employee; PCC and UA will provide network management training and software training to the Tribe's lab manager; charter school teachers, adult education instructors, and community members will receive basic user and software training. UA will support the connectivity as part of its overall network management. UA will also provide science modules and software to run them. PCC will provide on-line coursework and extensive student support.

Privacy—Community members' e-mail and personal files can be protected with security software and password entry.

Reducing Disparities

Last year Henry Cisneros's brother was in Tucson for a media project at a magnet high school. He wore a T-shirt that read, "If you don't have a T-1, you're a second class citizen." While the message may be crude, the sentiment is fairly accurate. Disenfranchised groups who have economic, educational, and cultural or language barriers cannot afford to become the information have-nots of our society. The Pascua Yaqui Tribe approached PCC for help in achieving computer connectivity. Tribal members want to use computers, to see what's on the Internet, to launch their own web pages, to develop their own software, and to have contact with their own and other people. They also want more educational opportunities that are relevant to their needs and accessible to their entire community. They need a place to start, an entry point. This project, by providing that access entry point, can be a beginning in reducing information disparities, along with education and training disparities, among the Yaqui people.

Evaluation, Documentation, and Dissemination

Evaluation--At both the UA and PCC, assessment is a key element in any educational initiative. For the Pascua Yaqui Connection project, an assessment team will be included in all phases involving instruction. Developmentally appropriate pre-test and post-test measures of use, satisfaction, and learning outcomes will be devised, as well as qualitative measures of outcomes among Yaqui end users. Cultural sensitivities, as well as learning styles, will be both accounted for and respected in all assessment efforts. Correlations among these factors, delivery modes, and content will be explored. Several questions occur regarding outcomes of this delivery and content:

Does it make a difference in knowledge and critical thinking skills?

Does it change the nature of learning?

Does it prevent dropping out of at-risk youth?

Specifically, the assessment team will take a developmental approach, recognizing common cognitive goals—1) Assessing learning with this content (science modules primarily, adult basic education [ABE] secondarily).

Educational milestones for different age levels for science education will be used to identify key concepts and measure outcomes from an environmental science curriculum. Assessment tools already in place for ABE will be used. 2) Assessing critical thinking skills. The environmental data and land-use scenarios embedded in the science modules will address issues relevant to everyday activities of the Pascua Yaqui Tribe. How are judgement, decision-making, and reasoning enhanced through this learning process?

Each objective of the project will have an evaluation component: ABE and science for charter school students as noted above; common access to Internet and e-mail for community members will be measured quantitatively; and software training for the lab manager, teaching staff, and community members will also be measured quantitatively. Assessment will focus on cognitive outcomes.

The assessment approach will be explanatory, not just recording outcomes. The team will seek to learn what works and what does not, and to further explore why some avenues to learning do not work, to make adjustments and improvements to the project and document results.

Documentation--PCC proposes to send a professional television production team consisting of two PCC staff to document each stage of the project on videotape. The College owns a professionally equipped and staffed production facility, which can be used in this process. The team will shoot Beta SP format in the field, will script a narrative jointly with designated Tribe members, create electronic graphics and animations as required, and post the project on a non-linear Media 100 edit suite. The oral narratives, which can be captured, on tape will provide anecdotal evidence of users' feelings and experiences during the project. Having a visual representation of the physical process of building renovation, retrofitting,* equipment installation, training, and use of the lab will also give viewers an accurate sense of what the project entailed, its successes and challenges, and how problems were solved. Documentation will also be accomplished in more traditional ways through the assessment team's efforts and by the project's external evaluator.

Dissemination--Dissemination of all documentation will be via multiple avenues. The videotape will be cablecast locally on the College's cable services and will be made available for national cable access distribution and offered to public television. Faculty and staff participants will be supported to publish and present their experiences with the project to their colleagues at conferences. End users will be offered the opportunity to contribute their experiences to Tribal web pages and to participate in a proposed Yaqui language Internet radio service.

*Although not funded by this grant, these represent important steps to connectivity readiness for any group.